



SOME OF THE

CRANIAL CHARACTERISTICS

OF

IDIOCY

BY

G. E. SHUTTLEWORTH, M.D.

MEDICAL SUPERINTENDENT, ROYAL ALBERT ASYLUM, LANCASTER

LONDON

J. W. KOLCKMANN, 2, LANGHAM PLACE

1881

Ballantyne Press

BALLANTYNE, HANSON AND CO., EDINBURGH
CHANDOS STREET, LONDON

SOME OF THE CRANIAL CHARACTERISTICS OF IDIOCY.

The remark is not uncommon, even on the part of medical visitors to idiot asylums, that the heads of the patients do not, when casually surveyed, appear so abnormal in size and form as they had expected to find them. A study of the leading varieties of cranial abnormalities existing among idiots, especially such as are characteristic of typical varieties, may therefore not be devoid of interest.

Employing the word idiocy in its comprehensive sense, as including cases of infantile arrest of mental development as well as those which are congenital, it may be said that the *general* average of the measurement of heads of a large number of idiotic children, and of a large number of normal children of corresponding age, will not differ very materially from each other. Thus, taking a series of 300 idiots and imbeciles at the Royal Albert Asylum, Lancaster, and of 100 normal children of the same social class at a neighbouring charitable institution, it was found that the average maximum head-measurements (circumferential) of groups of children of corresponding ages differed comparatively little in the two institutions, as shown in following table:—

Circumferential Head-measurements, given in Inches.	Ages. 5 to 10 years.		Ages. 10 to 15 years.		Ages. 15 to 20 years.		Average.	
<i>Royal Albert Asylum</i> Imbeciles }	20·10	18·83	20·20	20·19	20·83	20·18	20·5	19·9
<i>Orphan Institution</i> Normal Children }	20·89	19·73	20·70	20·60	21·25	21·25	20·87	20·33

Thus the general head-circumference at the Royal Albert Asylum was 20·5 inches (52·1 c.) and 19·9 inches (50·5 c.) for males and females respectively, as against 20·87 inches (53 c.) and 20·33 inches (51·7 c.) at the Orphan Institution. Examining the matter more closely, however, it would be soon apparent that the comparatively respectable average obtained for the head-measurements of the idiots was due to the abnormally large heads, which more than compensated for the abnormally small heads in the series.

We see then that mere *size* of head, save in extreme cases, is but of little help in the diagnosis and classification of idiocy. We may, however, often derive valuable aid from observing the varieties of cranial *form*. We shall, of course, find the most striking deviations from normal form amongst congenital cases. Perhaps the most remarkable of these is the microcephalic variety, which we will consider first. In different microcephals there are many differences of conformation, but there are, generally speaking, certain prevailing characters in the configuration of head and face. In the majority of cases which have fallen under my observation the skull has been oxycephalic, and

the occiput imperfectly developed; the facial features have been well-formed, the orbits large, the eyes prominent, and the nose often of the Roman type. Sometimes there is a tendency to prognathism. The tapering forehead and prominent nose give to the physiognomy, in some cases, a bird-like aspect, whilst, in others, the expression has been compared to that of a beaver or a mouse. The so-called "Aztecs" are idiots of this type; and the portraits* and head-contours of the boy Freddy (a patient at the Royal Albert Asylum) show most of the characters alluded to. This boy, seventeen years of age, and 4 ft. 6 in. high, has a head, the greatest circumference of which is under 15 in. (38 c.). This boy is still living. In the case of another whose head measurements were even smaller, and who died at ten years of age, the weight of the brain was but $13\frac{1}{2}$ oz. (383 grammes). In another case of microcephaly, in which the head measured $17\frac{1}{2}$ in. (44.5 c.) in circumference, the brain weighed $27\frac{1}{2}$ oz. (780 gr.); and, in a third, with a circumference of $16\frac{3}{4}$ in. (42.6 c.) the cerebral weight was $21\frac{1}{2}$ oz. (610 grammes).

The authority of the illustrious Virchow has often been quoted in support of the view that the cause of microcephaly is premature cranial synostosis. I am not sure that this opinion is held by him without qualification, but so far as my humble experience goes I am inclined to think that the premature synostosis is, as a rule, the consequence rather than the cause of the imperfect brain development. Such, at least seemed to be the case in an instance of microcephaly which I had the opportunity of pretty thoroughly investigating. As this case was fully described in the *Journal of Mental Science* for October, 1878, I will only now allude to it to say that the microcephaly depended upon some arresting influence having been brought into play to check the growth of the cerebral hemispheres backward and downward at about the sixth month of gestation, the development of the frontal convolutions having proceeded normally so far as the formative processes were complete. In this case the coronal suture was but imperfectly ossified though the girl was fifteen years of age. In another case (A.A.) a boy of ten, the anterior fontanelle seemed but imperfectly ossified and there was adhesion of the dura mater to that locality, and all along the inter-parietal suture.

Microcephalic idiots present many varieties as regards their mental condition, their intelligence varying to a considerable extent with the size of the head; but speaking generally it may be said that this class possess, as compared with other idiots, quick observation, expressive gesture, but deficient speech.

To pass to another well-defined type of idiocy, that known as the Mongol or Kalmuk type, we shall again find certain characteristic cranial and facial conformations. The skull is obtusely rounded, the longitudinal not much exceeding the transverse diameter, and the plane of the face and forehead, and that of the back of the head tend (as has been pointed out by Dr. Arthur Mitchell) to form parallel lines. There is, moreover, an obliquity of the superciliary margins of the orbits and an outward turning of the zygomatic arches together with a flat-bridged squat nose, which tend to impress on the patient the Mongolian aspect whence the name of the type is derived. Combined with these osseous abnormalities coexists a coarse papillated condition of the skin on the tongue, the latter being transversely fissured, and there is a clubbed appearance of the fingers and toes. Dr. Langdon Down has spoken of ethnic degeneration in connection with this type; but, however this may be, the etiology is generally pretty clear. In these cases there is no hereditary mental taint, no consanguinity of parents to be traced, but in almost all it is found that there has been some lowering of the maternal vigour, either through ill health, advancing years, or, it may be, some depress-

* Exhibited at Meeting; engraved in "Ireland on Idiocy," p. 93.

† For Head-contours of Microcephal (A. A., æt. ten) see Fig. 1, p. 5. Measurements—Circumference, $14\frac{1}{8}$ in. = 35.8 c. From nasal notch to occipital protuberance over vertex, $9\frac{1}{2}$ in. = 24 c.; Callipers, $4\frac{1}{2}$ in. = 11.5 c. From ear to ear over vertex, 10 in. = 25.5 c.; Callipers, 3 in. = 7.6 c.

Fig. 1.

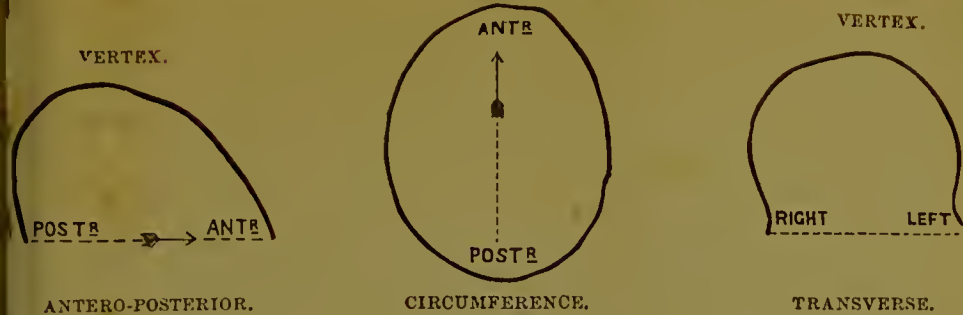


Fig. 2.

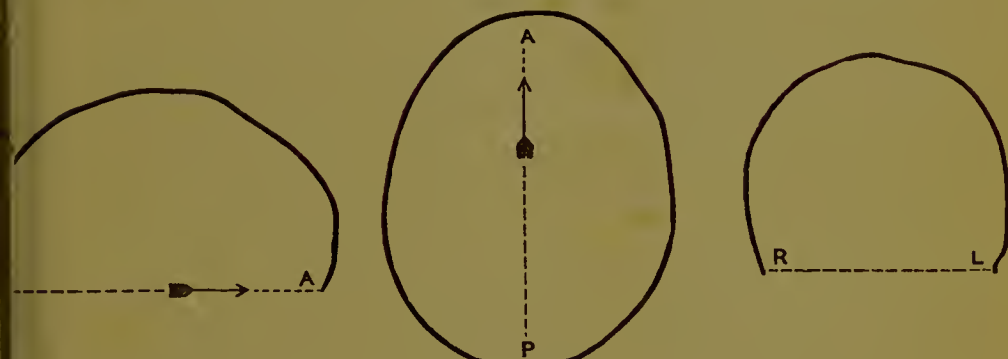


Fig. 3.

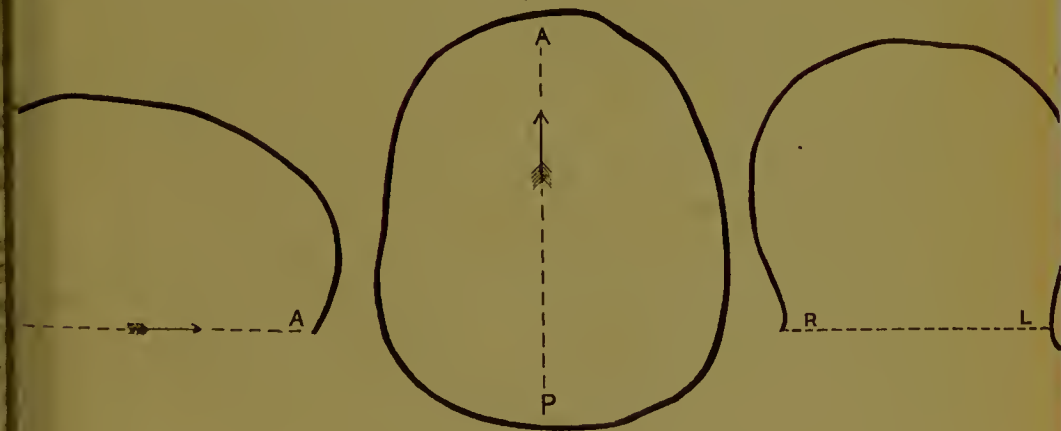


Fig. 4.

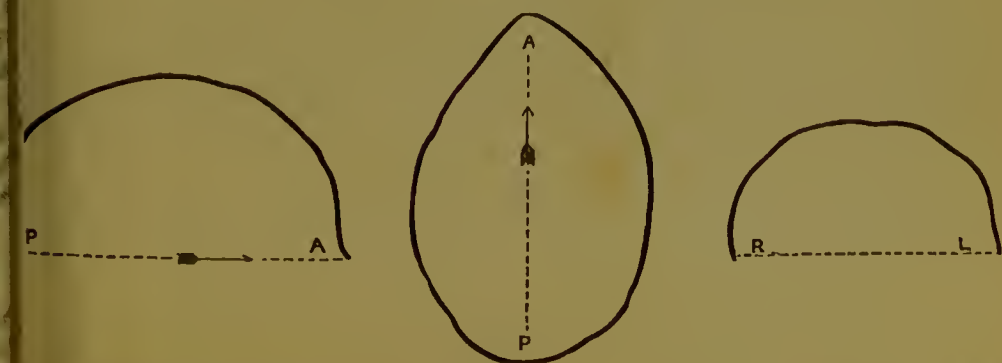


Fig. 1. Microcephalic Contours. —Fig. 2. "Mongol" Type ditto. —Fig. 3. Hydrocephalic ditto. —Fig. 4. Scaphocephalic ditto. —All one-fourth real diameters.

emotion during gestation. Idiots of this type are for the most part very imitative, they have a good ear for tune and time, and are capable of a fair degree of scholastic education. But their temperament is sluggish, and their vital powers feeble, and soon after puberty, if not before, they may be expected to die of some phthisical degeneration. The following are the measurements taken from the head of an imbecile of this type, thirteen years of age:—Circumference $19\frac{1}{2}$ in. = 49·5 c. Transverse, 13 in. = 33 c. Callipers, $5\frac{7}{8}$ in. = 14·5 c. Longitudinal, 12 in. = 30·5 c. Callipers, $6\frac{1}{2}$ in. = 16·5 c. Contours are exhibited in Fig. 2.

In cretinoid idiots, the large irregularly-expanded head, the distant orbits, and the depressed root of nose, co-exist with general heaviness, dulness of eyes, and wide and coarse nose and mouth, and a corresponding stupidity and slowness of comprehension. A special and peculiar class of these cretinoid idiots has been described by Curling, Hilton Fagge, and others under the name of “sporadic cretinism,” and in these there is a more pronounced dwarfishness of body with a curious bagginess of skin, as if the bony skeleton were made on a smaller scale than that of the integument. The mental stature as well as the bodily is dwarfed, and there is a remarkable deliberateness about all their actions, and in their speech, which in many cases is moderately well developed. The physical resemblance to each other borne by idiots of this type is very striking.

I have not had an opportunity of examining post-mortem any example of the latter type; but Dr. Beach and others have described the existence of fatty tumour above the clavicle and the absence of thyroid enlargement as characteristic of these cases. I have indeed only had one autopsy of a cretinous patient, a lad twenty years of age, 4 ft. $7\frac{1}{2}$ in. high, who had enlarged thyroid, and presented the ordinary characters of cretinism, though born in Northamptonshire, in a district where cretinism is not endemic. In this case the sutures were all closed, nothing remarkable was noticed about the spheno-basilar bone—[the head measured $20\frac{1}{4}$ in. (51·5 c.): circumference, $13\frac{3}{4}$ in. (35 c.) transversely, and $13\frac{1}{2}$ in. (34·3 c.) antero-posteriorly]—though a horizontal position of the basilar process—*i.e.*, an absence of the occipital basilar angle—has been noted by Lombroso, Fodéré, Ackermann and Niépce as one of the characteristics of cretinism. In the other variety alluded to (that somewhat confusingly called *sporadic* cretinism) a remarkable steepness of the clivus has been noticed by Virchow and other observers.

The cranial characteristics of hydrocephaly consist of a general obovate appearance, the crown looked at from above, the contour from back to front and side to side being more or less globular, and the greatest circumference being found at the temples, where there is sometimes a perceptible bulging. The back of the head is somewhat flattened. Imbeciles of this type, if not suffering from active disease, usually improve very considerably under training, and at last approach very nearly the standard of ordinary intelligence. This is exemplified in one of the cases whose head contours are exhibited, a lad of twenty-one, who, with the exception of a certain amount of childish curiosity and moral imbecility, may be described as cured.*

Resembling the hydrocephalic cases in size, though not in form of head, are those comparatively rare cases of hypertrophy of brain, which, when complicated with encephalitis, usually issue in a form of idiocy tending to pass into a variety of man. Dr. Fletcher Beach, who has paid much attention to the subject of hypertrophic idiocy, gives the following as the points of cranial distinction between hypertrophic and hydrocephalus:—

“In hypertrophy of the brain the head does not attain so large a size as in chronic hydrocephalus. The head of my first case measured 23 inches in circumference, that of the second 22 inches. I have three cases of chronic hydrocephalus now in asylum, and their heads measure $23\frac{1}{2}$, $25\frac{1}{2}$ and $25\frac{3}{4}$ inches respectively.

* *Head measurements: Hydrocephalic Imbecile (R. M., æt. twelve).*—Circumference, in. = 59·5 c. Transverse, $15\frac{1}{2}$ in. = 39·5 c. Callipers, $4\frac{7}{8}$ in. = 12·4 c. Longitudinal, $14\frac{3}{4}$ in. = 37·5 c. Callipers, $7\frac{3}{8}$ in. = 19·4 c. Contours are exhibited in Fig. 3.

"In hydrocephalus the increase in the size of the head is most marked at the temples; in hypertrophy above the superciliary ridges.

"In hypertrophy the head approaches the square in shape; in hydrocephalus it is rounded (see outlines). In hydrocephalus there is often an elasticity over the late closed fontanelle; in hypertrophy there is none, and there is often a depression in that situation.

"In hydrocephalus the distance between the eyes is increased from the fluid inserting itself between and distending the sutures formed by the frontal and ethmoid bones; in hypertrophy this is not the case."*

Dr. West says this disease is usually associated with rickets. In the only case which I can bring forward—that of a girl of twelve—there are no signs of rickets. In this case there is frequent complaint of headache, and the progress at school is slow.

In some cases of paralytic idiocy, atrophy of the brain on the opposite side produces marked asymmetry of cranial contour. Dr. Ireland mentions an instance in which a very irregular outline of the left side of the head corresponded with want of power of the right arm and leg. That such asymmetry does not always obtain, is shown by the head contour of E. C., a girl twenty years of age, whose right hand and arm are atrophied and partially paralyzed, the right hand being barely two-thirds the size of the left, but in whom the skull is fairly symmetrical. It must indeed ever be borne in mind that cranial asymmetry is by no means necessarily a sign of deficient brain development; indeed I have heard, on the authority of a noted hatter, that men distinguished for intellectual power (Lord Chancellors and others), are the men who have the most uneven heads! (In proof of this assertion a number of "Hatter's Shapes," taken from the heads of ordinary customers, by the Conformateur, were produced and compared with outlines supposed to be characteristic of abnormalities.)

Paralytic idiots, in whom there is no advancing disease, improve under training very considerably in intelligence, and those in whom athetotic movements exist, often possess a considerable degree of intelligence which is masked by their involuntary and ungainly contortions.

Scapho-cephalic heads, in which there is compression of the cranium from side to side with dolicho-cephaly, and a prominent ridge in the inter-parietal line and in the middle line of the forehead, are sometimes found amongst idiots. Pressure in parturition has been stated (I think erroneously), to be a cause of this distortion; but this is a condition normally found amongst the natives of New Caledonia, New Hebrides and the Caroline Islands. In the sporadic cases of scapho-cephaly, which have been examined in this country, a total absence of the sagittal suture has been observed, and Dr. Minchin ascribed the condition to the abnormal occurrence of only one central and vertical centre of ossification for the two parietal bones. Fig. 4 shows contours of a case of scapho-cephaly in a child one year old.

Traumatic cases vary so much in cranial characteristics and also in mental characters, that no general rule concerning them can be laid down. In one curious case I had under care, there was a large depression of the left occipital region, deep enough to admit the tips of two fingers, and at the autopsy the posterior part of the left hemisphere, which was thinned and elongated, overlapped the right.

The question of the influence of the use of the forceps on cranial deformity and resulting idiocy, can only be very briefly alluded to. Speaking generally, I concur in the conclusions arrived at by Dr. Langdon Down in his paper, read before the Obstetrical Society, that the forceps has but little to answer for in the production of idiocy. Protracted labour, unassisted by forceps and producing asphyxia neonatorum, is probably a much more potent factor of idiocy. Dr. Down remarked, that of 2,000 cases examined by him, only 3 per cent. were delivered by forceps, though as many as 50 per cent. were born with well-marked symptoms of suspended animation. In the first 600 cases in the books of the Albert Asylum, not more than 2 per cent. are

recorded as having been forceps deliveries, though I ought to add that of the last 250 cases (I know not from what cause), a much larger ratio of cases is *attributed* to the use of forceps—viz., about 4 per cent. In less than a quarter of the cases, however, were there any marks left by forceps.

The subject of artificial cranial deformations is one full of interest, but the only variety met with in this country is that produced by unilateral suckling, of which I have seen several examples, though the cranial asymmetry, which consisted of flattening of the parieto-occipital region on one side, was unaccompanied by any mental deficiency. It would appear that very considerable artificial deformation may be produced by prolonged, but comparatively gentle, pressure in one region of the skull compensatory enlargement going on elsewhere, and no detriment to the intelligence resulting. The Flat-head Indians (Chinooks), are modern examples of this statement which however was observed so long ago as the days of Hippocrates, with regard to the Caucasian Macro-cephali.



TIGHT GU